

---

**Kovinski prah - Ugotavljanje specifične ovojne površine z merjenjem zračne prepustnosti nasute plasti prašnih delcev pri ustaljenem toku zraka skozi (ISO 10070:2019)**

Metallic powders - Determination of envelope-specific surface area from measurements of the permeability to air of a powder bed under steady-state flow conditions (ISO 10070:2019)

Metallpulver - Ermittlung der spezifischen Außenoberfläche durch Messung der Luftdurchlässigkeit einer Pulverprobe unter gleichförmigen Strömungsbedingungen (ISO 10070:2019)

Poudres métalliques - Détermination de la surface spécifique d'enveloppe à partir de mesures de la perméabilité à l'air d'un lit de poudre dans des conditions d'écoulement permanent (ISO 10070:2019)

**Ta slovenski standard je istoveten z: EN ISO 10070:2019**

**ICS:**

77.160

Metalurgija prahov

Powder metallurgy

**SIST EN ISO 10070:2020**

**en,fr,de**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN ISO 10070:2020

<https://standards.iteh.ai/catalog/standards/sist/2375336d-cf93-4662-ae33-51a3d95e1fle/sist-en-iso-10070-2020>

EUROPEAN STANDARD

EN ISO 10070

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2019

ICS 77.160

English Version

**Metallic powders - Determination of envelope-specific surface area from measurements of the permeability to air of a powder bed under steady-state flow conditions (ISO 10070:2019)**

Poudres métalliques - Détermination de la surface spécifique d'enveloppe à partir de mesures de la perméabilité à l'air d'un lit de poudre dans des conditions d'écoulement permanent (ISO 10070:2019)

Metallpulver - Bestimmung der spezifischen Außenoberfläche durch Messung der Permeabilität von Luft in einem Pulverbett unter gleichförmigen Strömungsbedingungen (ISO 10070:2019)

This European Standard was approved by CEN on 14 December 2019.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

Contents	Page
European foreword.....	3

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN ISO 10070:2020](https://standards.iteh.ai/catalog/standards/sist/2375336d-cf93-4662-ae33-51a3d95e1fle/sist-en-iso-10070-2020)  
<https://standards.iteh.ai/catalog/standards/sist/2375336d-cf93-4662-ae33-51a3d95e1fle/sist-en-iso-10070-2020>

## European foreword

This document (EN ISO 10070:2019) has been prepared by Technical Committee ISO/TC 119 "Powder metallurgy" in collaboration with Technical Committee CEN/SS M11 "Powder metallurgy" the secretariat of which is held by CCMC.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2020, and conflicting national standards shall be withdrawn at the latest by June 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

### Endorsement notice

iTeh STANDARD PREVIEW

The text of ISO 10070:2019 has been approved by CEN as EN ISO 10070:2019 without any modification.

[SIST EN ISO 10070:2020](https://standards.iteh.ai/catalog/standards/sist/2375336d-cf93-4662-ae33-51a3d95e1ffe/sist-en-iso-10070-2020)

<https://standards.iteh.ai/catalog/standards/sist/2375336d-cf93-4662-ae33-51a3d95e1ffe/sist-en-iso-10070-2020>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN ISO 10070:2020](#)

<https://standards.iteh.ai/catalog/standards/sist/2375336d-cf93-4662-ae33-51a3d95e1fle/sist-en-iso-10070-2020>

INTERNATIONAL  
STANDARD

ISO  
10070

Second edition  
2019-12

---

---

**Metallic powders — Determination of  
envelope-specific surface area from  
measurements of the permeability to  
air of a powder bed under steady-state  
flow conditions**

*Poudres métalliques — Détermination de la surface spécifique  
d'enveloppe à partir de mesures de la perméabilité à l'air d'un lit de  
poudre dans des conditions d'écoulement permanent*

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

[SIST EN ISO 10070:2020](https://standards.iteh.ai/catalog/standards/sist/2375336d-cf93-4662-ae33-51a3d95e1fle/sist-en-iso-10070-2020)

<https://standards.iteh.ai/catalog/standards/sist/2375336d-cf93-4662-ae33-51a3d95e1fle/sist-en-iso-10070-2020>



Reference number  
ISO 10070:2019(E)

© ISO 2019

## iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO 10070:2020

<https://standards.iteh.ai/catalog/standards/sist/2375336d-cf93-4662-ae33-51a3d95e1fle/sist-en-iso-10070-2020>



### **COPYRIGHT PROTECTED DOCUMENT**

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland



# Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Symbols</b> .....	<b>3</b>
<b>5 General principles</b> .....	<b>4</b>
5.1 Permeability.....	4
5.2 Carman-Arnell and Kozeny-Carman formulae.....	4
5.3 General.....	5
5.4 Envelope density.....	5
<b>6 Procedure</b> .....	<b>6</b>
6.1 Preparation of test portion.....	6
6.2 Preparation of packed powder bed.....	6
6.3 Determination.....	6
<b>7 Expression of results</b> .....	<b>6</b>
<b>8 Test report</b> .....	<b>7</b>
<b>Annex A (informative) Examples of methods of determining the permeability to air of a powder bed</b> .....	<b>8</b>
<b>Annex B (informative) Preliminary treatment of powder for de-agglomeration</b> .....	<b>17</b>
<b>Bibliography</b> .....	<b>18</b>

SIST EN ISO 10070:2020  
<https://standards.iteh.ai/catalog/standards/sist/2375336d-cf93-4662-ae33-51a3d95e1fle/sist-en-iso-10070-2020>

## ISO 10070:2019(E)

### Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 119, *Powder metallurgy*, Subcommittee SC 2, *Sampling and testing methods for powders (including powders for hardmetals)*.

This second edition cancels and replaces the first edition (ISO 10070:1991), which has been technically revised.

The main changes compared to the previous edition are as follows:

- introduction of an automated test device based on the Gooden and Smith method, including procedure and calibration.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

The measurement of the permeability of a packed powder bed to a laminar gas flow is the basis of this document. The determination can be made either at constant pressure drop (steady-state flow) or at variable pressure drop (constant volume). This document deals only with determinations made under steady-state flow conditions.

The permeability measured is influenced by the porosity of the powder bed. For a given particle shape, the values of permeability and porosity can be used to calculate a specific surface area of the powder by means of different formulae.

The surface area so calculated includes only those walls of the pores in the powder bed which are swept by the gas flow. It does not take into account closed or blind pores. It is known as the envelope-specific surface area. It can be very different from the total surface area of particles as measured, for instance, by gas adsorption methods.

A single equation is used in the standard methods described in this document. It entails certain limitations with respect to the type of powder (particle shape) and the porosity of the powder bed for which the method is applicable. Consequently, this is not an absolute method, and the value obtained depends upon the procedure used and the assumptions made.

The specific surface area determined can be converted into a mean equivalent spherical diameter (see [Clause 3](#)).

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 10070:2020](#)

<https://standards.iteh.ai/catalog/standards/sist/2375336d-cf93-4662-ae33-51a3d95e1fle/sist-en-iso-10070-2020>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN ISO 10070:2020](#)

<https://standards.iteh.ai/catalog/standards/sist/2375336d-cf93-4662-ae33-51a3d95e1fle/sist-en-iso-10070-2020>